VACCINATION.

By W. C. Van Bibber, M. D.

(*A paper read before the Baltimore Academy of Medicine, March 20th*, 1883).

Some of those present heard me make the assertion recently upon this floor, that I thought I had vaccinated in public and in private practice, during the last thirty-five years, at least 10,000 persons; and that I had never heard of a single case, that I had vaccinated, having taken the varioloid. I must now qualify this assertion, as to the numbers, and say that I have no actual record of the exact number of all my vaccinations, but I know they are many thousands. It must not be inferred from this remark that I consider there has been any peculiar excellence in my manner of vaccination over that of others, or that there is a charm about my touch—not in the least. But, I do mean, that I have always, in public, as well as in private practice, taken much care in the selection of the vaccine virus I have used, also in the manner of doing the operation, and have tried, when it was possible, to watch the course of the vaccine disease, both in the primary and in re-vaccinations; and when the disease was not entirely satisfactory, in either case, I have repeated the operation whenever it would be permitted. I have referred to this matter again, because there are practical points concerning vaccination, and public questions connected with its protective power against the infection of variola, to be mentioned in this paper, upon which it will be seen that this fact may have some bearing.

As time wears on, it is found that variola gets more and more common. It is plain now, from this fact, that, if Dr. Jenner's estimate of the protective power of the vaccine disease was not set too high, there must be, at present, something wrong about the manner in which vaccination is performed. From what I have seen, and even from the fact I have given, about my own vaccinations, I believe there is something wrong about the manner in which vaccination is generally performed. This I say, with the full knowledge of the fact, that the contagious exanthemata, small-pox at the head of them, have their periods of dormancy and activity. "Every now and then," says Dr. Watson, "at irregular intervals, and as it would seem to our ignorance of the cause, capriciously, small-pox overspreads a district or country, as an epidemic." "At this 'moment,' continues Dr. Watson (1838), it is more prevalent in London and in many parts of England than it has been known to be for many years past." What would he say now, if he were alive, and could see the last statistics? "When epidemic," he says again, "it is also, in general, more than ordinarily severe; although different epidemics

vary much in this respect." If these laws which have been closely observed, are applied to the present situation in Baltimore, that will be found true, which was said by the late Dr. Samuel T. Knight, once City Physician, in one of his reports: "Since 1798,* when vaccination was first introduced in Baltimore, at intervals of 15 or 20 years, there has been such an increased number of cases of small-pox that it has been denominated an epidemic." For proof of this, Dr. Knight cites the record of statistics up to the time of his report in 1863. I witnessed the epidemic of that year as well as the one in 1845, and now, in 1883 the people of Baltimore are having a like experience. Why is this so? The public ask this question of the physicians; and the younger members of our profession ask the same question of the elder members. I have no hesitation in saying, and I have a right to say it, without fear of being misinterpreted in this presence, if all were vaccinated, as I have hitherto been able to vaccinate thousands, and, as you all could say you have performed your vaccinations, then there would be no small pox or varioloid.

Notwithstanding the history of former visitations of small-pox, the present one has been of more serious injury to the business of Baltimore than any one of those which preceded it. It may be asked again why is this so? It surely will be a part of wisdom to find this out, if it can be done,and to prevent the occurrence of another epidemic, or spreading of small-pox, if it is possible. And I believe now, that with proper care, it is possible. We have much knowledge upon this point; it should be faithfully recorded and never forgotten. There are means and advantages now for tracing contagious diseases to their first cause, which were never possessed before. An account of the commencement of one of the recent outbreaks of small-pox in Baltimore has been published in the suplement of the National Board of Health Bulletin. The facts are reliable. They were given by Mr. A. R. Carter, the present Secretary of the Board of Health of Baltimore. According to this statement, small-pox was brought to Baltimore on the 27th day of December 1879, by one Cordes, who came from Washington City. It was traced straight along from him to every other case which happened in Baltimore until it was subdued, or, as it is aptly termed, "stamped out," by vaccination in the following September. Again, the present visitation was brought to Baltimore in the person of a child, who came from Alleghany City, Penna., on the 11th of November, 1881. All the other cases which have occurred in Baltimore since that time, have been traced straight along from that child. What advantages do we possess now in being able to obtain such accurate information, and what practical use may be made of this information hereafter for any city or district? The interesting question now is this: Why did small pox spread from either of these cases notwithstanding the boasted efficacy of vaccination? Was it the fault of the vaccine virus? or of the manner of performing the operation? or from the neglect of vaccination altogether? I believe that all these three factors had something to do with it, and I must give you other reasons besides the one I have already given, why I hold this opinion. The proposition is plain. If every individual had been as properly protected at the beginning, as at the end, the spread of the small-pox would not have occurred.

---

*Vaccination was first practiced in Baltimore (as will appear from a valuable historical paper on the subject by Dr. Quinan, shortly to be published in this journal) in 1800, being introduced here *simultaneously* with its introduction into Massachusetts. It then ceased here (*as there*), to be resumed the following year by Dr. James Smith, since which there has been *no break* in its practice in Baltimore.—EDS.

I will first speak of the vaccine virus itself. What I can say personally on this subject, will at least serve to show that the medical profession in Baltimore, were not entirely idle, when those of our profession, in other places, were actively employed, in experiments, concerning what was called the renewing or renovating the vaccine virus. This great question of that day (about 1840) was then being studied and acted upon by the profession of Baltimore. It must be confessed that these experiments, with their results, were not carefully published when performed, so as to have added, as they should, to the general store of knowledge then being obtained upon this most important question. It is to remedy this dereliction, and to compare the position of the study then, with its present situation, so far as it can be done now, that this paper has been prepared.

What I can say, of my own personal knowledge and observation, concerning the vaccine virus used in Baltimore is this: between the years 1845 and 1873 I used in my practice six varieties of vaccine virus; I say varieties because they came from different sources.

The first was vaccine virus I found here in common use amongst the physicians of Baltimore in 1845. It is now called by vaccinators Jenner matter.

The second variety was given to me in 1846 by Dr. Wm. T. Leonard, who was at that time City Physician of Baltimore.

The third variety was given to me in 1863 by Dr. Samuel T. Knight, who was then City Physician of Baltimore.

The fourth variety was brought from Germany in 1863 to the late Dr. George Gibson and was given to me for trial.

The fifth was imported from England, in 1864, by Dr. F. E. Chatard, of Baltimore, through the firm of Mileau & Co., of New York.

The sixth variety is that which is in common use in Baltimore at present. It is called the Bovine Virus; claims to be from the Beaugency origin, and is largely used throughout the United States. Of this Beaugency Bovine virus I have used specimens brought over originally from France by Dr. Lanoix; specimens procured from Messrs. Mileau, of New York; specimens procured from Dr. Henry A. Martin, of Boston, from the late Dr. Wilson Regester, formerly Vaccine Physician of Maryland, and also from his brother who is now engaged in furnishing it; specimens from Dr. Frank P. Foster, of New York; from the Chelsea, and Chambersburg vaccine farms; from the National Vaccine Establishment in Washington, and also some other vaccine establishments of less note.

The history of these six kinds of vaccine virus, how they came into my hands, in what manner they were used and their effects as observed by me, is briefly this:

The first variety, viz., that which was in common use in Baltimore in 1845, claimed its origin from England, and was brought to Baltimore City in 1801 by the late Dr. James Smith. It had then been in use in Baltimore forty-four years. At the time I commenced to use it (in 1845) it was to be found only in the hands of physicians. It was preserved by them in the form of crusts taken from infants. During the time that I used vaccine virus in this form, I tried to preserve the crusts in different ways, viz.; in glycerine; by

burying them in the cellar; and in some other ways which need not be mentioned. The difficulty was to keep a crust active from June until October. During the months of July, August and September, there was little vaccination done. The hot nights, and the presence of mosquitoes, in this climate, during these months, caused the children to be restless, so that either the vesicles or pustules were likely to be broken, and there was but little chance of preserving a perfect crust. Finally I procured two heavy soapstone boxes, and by keeping these in a cool, shady place, upon a marble slab, I found this a most effective way to preserve the activity of the matter.

In parting with the use of the crust, together with its accessory attendants, as a means of preserving the activity of such a valuable medical agent, I am sure, you will pardon me, if I attempt to record some incidents in its history, in a few words, as I observed them.

All physicians were not equally careful in selecting, preserving and using vaccine crusts. Those who were careful in this respect, considered a crust valuable, on account of its source, its age, its appearance and its effects. The source included the physician who had selected it, as well as the infant from whom it was taken. One physician would guarantee a crust to another physician. This guarantee meant that the owner had observed the vaccine disease, as it occurred in the child from whom it had been taken, and that the child was healthy; the guarantee further meant that the crust was not more than two weeks old, and that some special care had been taken in its preservation. When selected only from their appearance, those crusts were esteemed best which were round, about half an inch in diameter, depressed in the centre, of a brown mahogony color, uniform in thickness, clean, dry and marked upon their smooth under surface with a shining white pellicle, which, upon close inspection, bore marks of cell partitions in the original vaccine vesicle. The effects which such a crust were expected to produce were those of the genuine vaccine disease, which it is needless to describe here, just now.

For use, the crusts were mounted on wax, or corks and wafers, in boxes made generally of gold or silver; and when the physician of that day would loan his vaccine box to a brother physician, as often happened, some estimate of the value of the virus could be formed from the appearance of the inside of the box. If the interior was clean as to the wax, and the mounting carefully done, it was an omen that the physician was careful in the selection and preservation of the crust, and if its owner said to his confrere, upon handing it to him, "I have tried that crust, sir; it is eight days old; it is good and active," then these were statements which might be relied upon with much certainty.

I have been careful in describing these minute details for two reasons. They will show that at that time physicians guaranteed their own vaccine virus, and were responsible to each other and the public for it. And again, in parting with this old custom, which, for sixty-five years or more was one means amongst us of extending professional assistance and courtesy, but which is now superseded and has passed into history, I could not resist the opportunity of recalling to your recollections a picture, which, with all its

associations, we may affectionately look upon as upon the portrait of an absent friend, and cherish it as one would a valuable pearl picked up from a distant beach.

The second variety of matter which I used was that given to me by Dr. Wm. T. Leonard. Its origin is thus told by him in a report to the Mayor and City Council of Baltimore, dated the 31st of December, 1846. Dr. Leonard says: "It will be remembered that, at the period of the last report, our city was so much infected, and the lives of the citizens so much endangered by the small-pox, as to induce the Council at its last session to pass an ordinance appointing a vaccine physician for each ward, and a resolution appropriating one hundred dollars to be expended by the City Physician in procuring vaccine virus. * * In obedience to the resolution for procuring vaccine matter above alluded to, the City Physician immediately inoculated several cows with the virus of small-pox. He also introduced the vaccine virus, taken from the human system, into the udder of a cow. Another cow he caused to be clad with the blankets taken from the bed of small-pox patients, and to have her food put in a bag made of the same material and suspended to her head."

Dr. Leonard does not mention the result of this last experiment. The vaccinated cow gave a better success, according to him, but to what amount the virus from it was used in the city I cannot say. I had nothing to do with that experiment.

Dr. Leonard continues in his report: "In one case where the virus of small-pox had been introduced into the udder of a cow, a small crop of pustules resulted, but upon introducing the matter from them into the human arm, a satisfactory result was not obtained." I was then the vaccine physician of the 20th ward, and Dr. Leonard gave to me one of the crusts from the inoculated cow, with instructions to use it upon one or more children, and report. I used it upon a child named Henry Urner, five months old, living upon Pennsylvania Avenue. The disease which resulted was severe. The punctured point soon became angry and painful, and continued so throughout the disease. There were, besides the punctured point, between thirty or forty pustules scattered over the body of the child. Some of these pustules kept a regular variolous course, and others soon dried up. It was pronounced a case of inoculated variola, and when the result was reported to the Health Office, and discussed by my elders in the profession, it was advised not to carry the use of this matter any further. For many years, I kept a knowledge of Henry Urner, as boy and man, but have not seen him recently.

As this was the first recorded attempt of variolation made for the purpose of changing the vaccine virus then in general use, in Baltimore, it may be asked why was the attempt made? By referring to the history of the subject of vaccination for this period, or from about the year 1844, it will be seen that these experiments were not original with Dr. Leonard. Already the question had been agitated in Europe and in this country, whether the supposed lessened protective power of the vaccine virus, then in general use, was not the main cause for the alarming increase of small-pox? It was to solve this question that the Health Board was induced to make these attempts to renew the vaccine virus.

The third variety of matter which I used was given to me in 1863, by the late Dr. Samuel T. Knight, then City Physician of Baltimore. He then also made the attempt to renew the source of the vaccine virus, actuated by the same reason which had induced Dr. Leonard to do so, eighteen years before, viz., the then prevalance of small-pox. Dr. Knight says in his report to the Mayor and City Council under date December 31st, 1863: "Two hundred and fifty-two deaths from small-pox occurred during the year. * * Reliable vaccine matter having been scarce and difficult to procure, we purchased a cow, and passed the variolous matter through her system with entire success, thus procuring a supply of good vaccine virus, which we have distributed amongst our medical friends." As Dr. Knight has not left, in his report, or in writing, full details concerning his experiment, I will tell briefly what I heard him say, and what I saw, concerning this experiment, which was remarkable in some of its features.

Dr. Knight told me, that he went to the Small-pox Hospital, and saturated a portion of a skeine of silk with the lymph from small-pox vesicles, and after shaving a place upon the udder of a cow, he made three incisions in the skin, into which he laid shreds of the saturated silk, and secured them there for a short time, with adhesive plaster. He had never seen the operation done, and was guided by his own ideas concerning it. The cow was kept in his own stable, and in the adjoining stall was his horse. There was only a slat partition between them. I saw the cow on the 8th day after the operation. She was then lying down, evidently drooping and sick. She would not eat. Her horns and tail were hot. We had no clinical thermometers at that time. I saw her again on the 16th day. She was then standing up, but looked poor and feeble. Dr. Knight told me, that between the 18th and 23rd days after the operation, at different times, he took more than twenty crusts from around the udder of this cow. Besides these she had a number of crusts over her body; he counted more than seventy. Dr. Knight offered me the first choice of the crusts from the udder. The one I selected was, in all its markings, a typical vaccine crust, such as I have before described. With this, I vaccinated, on the 20th of July, 1864, the child of a German, then living on the corner of Paca and Ross streets, Baltimore. The child was five months old and healthy. Drs. Dulin, Chatard, John O'Donavin, John Mackenzie, Knight, and others, saw the child with me at my request, on the 5th, 8th and 12th days. It was pronounced a genuine vaccine disease, and it was advised by all these physicians that the crust should be used, and further trial made of its effects. This I did, and it apparently produced a genuine vaccine disease. I kept the matter separate from the old virus for a long time, and supplied other physicians with it. In this way it was spread by myself and others, largely throughout this city and the adjoining States. After the cow recovered, the horse became lame and useless from a running in his feet, and Dr. Knight sent him to the country, where he recovered.

The fourth variety of matter which I used, was given to me by the late

Dr. George Gibson, on the 14th of October, 1864. It came from Germany and was put up in glass tubes closed at both ends. Six children were brought to Dr. Gibson's office and vaccinated with this vaccine lymph. All the operations were successful, and during the remainder of the year 1864 and during 1865, I kept this matter separate, and supplied others with it.

The fifth variety was given to me by Dr. F. E. Chatard in 1865. It was called bovine virus, and came from England. Other than this we have no further history of it. Dr. Chatard, at that time considered its results as much better than any other he had used. He supplied me and many other physicians with it. I also kept this matter separate from any other, for a time.

The sixth variety of vaccine virus which I have used is what is now known as the Beaugency virus. This has now supplanted all other matter, and is in general use in Baltimore and throughout the United States.

Dr. Charles R. Drysdale, of England, in a pamphlet published in 1882. "*On Animal Vaccination, and the Origin of Vaccine*," p. 19, gives this history of the Beaugency matter: "When, on April 26th, 1866" (17 years ago), "a case of spontaneous cow-pox was said to exist at Beaugency, Loiret, fifteen miles from Orleans, Dr. Depaul, director of the vaccine department, hurried off to Beaugency to see it. He there saw the young milch-cow in which the cow-pox had appeared. She was thirty months old, and four months after calving. Her milker observed she was restive one day (March 28th). A *sage femme* in the neighborhood, Me. Lambert by name, remarked vesicles on the udder much resembling vaccine vesicles. She told the fact to a veterinary surgeon, M. Daridan, who, with some physicians of Lyons visited the cow, and found that she had seven or eight vesicles on the skin of the udder. A horse separated from the cow merely by a board partition, was carefully examined, but had no disease. No one knew the age of the vesicles. On March 29th, a cow, three years old, and two infants, were inoculated with the virus, and, on all, the operation gave vesicles at every point of insertion.

"Dr. Brechemeier, of Lyons, went to Beaugency, on April 15th, and saw the second cow, which had six crusts on the points of insertion, which he he used to inoculate a calf on his return to Lyons. This succeeded and the series was carried on, so that, when Depaul arrived at Lyons, on April 30th he was able to vaccinate a calf at Orleans and carry it off to Paris. This was the sourse of the undoubted animal vaccine of Beaugency, which has been used ever since in the United States of America." Dr. Henry A. Martin, of Boston, claims to have introduced the 258th, 259 and the 260th series from this cow into this country.

It may now be asked, which of the six varieties of vaccine virus, which I have used, is the best? This is the important practical question of the entire subject. My opinion might be given in two words, and then there would be no necessity for further writing, provided there was positive proof, or knowledge, to sustain those words. But, unfortunately, from what I have already said, it is plain that the different kinds of vaccine virus have become mixed, and it behooves us to try and advance the subject from its present situation.

I will endeavor to give some facts concerning the different kinds of vaccine virus, which have been mentioned.

I believe that the first variety used by me, that is, the original matter found here in 1845, was good, and furnished a reasonable protection from the contagion of variola, and I will give you my reasons for saying so.

Early in this century the late Dr. Peter Chatard was a prominent practitioner of medicine in Baltimore. He experienced, at that date, much public opposition against vaccination. The same arguments were used here which are mentioned by Mr. Watson, as having been used in England, viz: that it was impious to give a disease from cattle to Christians, etc. Dr. Chatard had then four children, three sons and a daughter. After observing a proper vaccine disease in his children, he proposed to send them all to the house of a prominent public man, a Mr. Pechin, the editor of the *Chronicle*, where there was a case of variola. There was an objection, in the family about sending the daughter, to which he yielded; but the three sons. the present Dr. F. E. Chatard, and his brothers Henry and Frederick, were sent to Mr. Pechin's, where they played for several hours, in the room where the small-pox patient was confined. None of the children took the disease. The example had the desired effect; there was no longer an opposition to the operation of vaccination. All honor to the memory of Dr. Peter Chatard. By this act, he showed, at least, that he had the quality now so much admired among men—the courage of his opinions. Who amongst us would do this same thing now? And what vaccine matter would you select wherewith first to vaccinate your children?

In the month of January, 1846, I vaccinated an infant four months old, living in Marion St., Baltimore. The mother refused to be vaccinated. The operation upon the infant was successful. About seventeen days after the vaccination of the child, and while the crust was yet upon its arm, the mother had a chill, which in three days was followed by the eruption of variola. Prof. Levin S. Joynes, then of Baltimore, and afterwards of Richmond, visited this case with me. It proved to be a semi-confluent case of small-pox—confluent over the face and breast, and discrete upon the extremities.

We visited the patient every day for twenty days, and afterwards occasionally for the period of five weeks. The mother nursed the infant at the breast during the entire attack. Often we found the child, which was a plump little thing, closely covered under the bed clothes, for the weather was cold, tugging away at the nipple with a pustule almost under its nose. We remonstrated about this, but the mother said "her milk was scanty since she had the fever, and it took the child a long time to get enough." The vaccine crust was removed from the child's arm on the twenty-first day. I did not use it, although the infant han no symptom of varioloid or any sign of sickness. No attempt was made in this case at disinfection. The circumstances were so extreme that they were supposed to be beyond such a power. The only precaution taken was to rely simply and solely upon vaccination. This was an exceptional case, to show the protective power of vaccination, a greater than which, probably, few physicians have had an opportunity of observing.

Still, however, let me relate to you one more case concerning this same

matter. Samuel Bayne, aged 23, was attacked with variola on the *6th* of January, 1864. His father, John Bayne, aged 46, arrived from the country to nurse him upon the *8th*. John Bayne, the father, had been vaccinated in infancy. On the 9th of January I revaccinated him with the same original matter. The vaccination was successful, but I could not tell how regular its course might have been, as he ruptured the vesicle. The room in which he nursed his son was small and close. He never left this room but once for twenty days. On the 26th of January he was attacked with fever and headache. His features were flushed and swollen. On the 27th the fever subsided, and on the 28th it was entirely gone.

Vaccine virus that can thus protect, as these cases show this original matter did in the hands of Dr. Chatard, and in my hands, has a good record. "There is no contagion so strong and sure," says Mr. Watson, "as that of small-pox; none that operates at so great a distance." Mr. Haygarth states "that during his long attention to this subject, not a single instance had occurred to prove that persons liable to the small-pox, could associate in the same chamber with a patient in the distemper, without receiving the infection." Will any one seriously contend that if the four children and one man, whom I have mentioned, had not been duly vaccinated, they would not have taken the disease?

If I could stop here, the proof of the all-powerful protective efficiency of this original matter would be clear and complete. But having said this much, every consideration demands that I should tell you at least two cases, out of many that I have seen, in which a complete protective power of the same virus was not so manifest.

In March, 1846, seven young physicians, of whom I was one, visited together the small-pox hospital on Laudenslager's Hill, Baltimore. If there was not a living witness, in the person of Prof. F. Donaldson, of what I am about to relate, I might hesitate to describe, in detail, the imprudent kind of proof, to which the protective power of this virus was then submitted. The hospital was a single story, half-double house. When the front door was opened we entered the principal room or ward; there were two rooms, with a door between. The room we entered was crowded with the living and dying, and there was one dead man.

I think there were over thirty patients in the two rooms. As the rooms were darkened, we were obliged to bend near the bodies of the patients in order to examine minutely the stages of the eruption. We soon became interested in this investigation. We traced the eruption of variola from its earliest stage, to its last, upon the body of the corpse. We visited every bed. I am not certain of the exact time we remained in the house, for no one kept the record; but it must have been long, to have done what we did. Within a fortnight of that visit the late Prof. C. Frick, who was one of us, had varioloid. The next attacked was the late Dr. Alfred Baker. His disease was severe. Then followed, in succession, the late Drs. Alex. Robinson, John Berryman, and Dr. Steadman Tilghman. Prof. Donaldson and myself escaped the contagion. Two out of seven escaped. I had vaccinated myself before going into the room, and did so again after I came out of it. The other physicians, I believe, did the same.

On the 17th of January, 1864, Mr. H. W. nursed Mr. W., in his room in a hotel, Mr. W.had varioloid. Dr.Gillingham revaccinated Mr. H. W.on the 28th of January. Six or seven days after this, an attack of varioloid set in with a chill. The disease was severe. These two examples show that the protection of the original vaccine virus was not complete; but by an examination of the subject, it will be found, that it was as complete in 1864 as the same matter was in Dr. Jenner's time. It has never been so complete as not to furnish exceptions.

Concerning the second variety of matter which I used, it simply amounted to an experiment, which was new here at that time, but had been done before, and has been done since I vaccinated the child on Penna. Ave When the lymph of variola is passed through the system of a cow, and again from her reintroduced into the human being, it is, I believe, a case equivalent to one of inoculated small-pox. But the protective value of this inoculation is the thing to be considered. If the operation is carefully done, I can see no good reason why it should not be protective to the human subject; but it will take such experimenters as M. Pasteur, and such exhaustive experiments as those conducted by him, to decide such a question in all its ramifications.

The third variety of virus, which I used, viz., that obtained from Dr. Knight, was similar to the second, as to its source. The only difference was that the child at the corner of Paca and Ross Streets had a milder disease than the one on Penna. Ave., and I was advised to continue the use of this matter, which was done as already mentioned, to a large extent.

The fourth and fifth varieties were called bovine virus from Germany and England respectively. Both seemed to give a genuine vaccine disease.

The sixth variety demands more attention, because it is the virus which has superseded all others, and is the only matter that can now be obtained. It is from the Beaugency stock, and demands at present, from all physicians a most careful study. I mentioned many sources from which it is obtained. If it does afford the same protection from the contagion of variola as the original Jenner matter, then, as the profession and the public have accepted its source and its manner of propagation, viz., through the cow, its use is certainly a step in advance. The revulsion in popular prejudice is overcome and seems truly complete. Once the public would not be vaccinated because the matter came from a cow—now they will permit the use of none that comes from an infant.

It has been alleged during the trial of the bovine virus in Baltimore, as it is now brought into the market, that it is variable and uncertain. The results which I have obtained from its use cause me to agree with this opinion. But when it is known how many vaccine farms have sprung into existance, almost within a few weeks, most of them having inexperienced operators, such results might naturally be expected.

It is claimed by some for the Beaugency virus that it is not variola reduced to the minimum, but that it is a genuine vaccine disease originating in the cow, which is antagonistic to variola, and not identical with it.

The important question has been asked, why has variola continued so prevalent in Baltimore since the first case was brought to the city on the

11th of Nov., 1881? We may be assisted in the solution of this question by asking another, viz: Why has it almost completely disappeared since the middle of February, 1883? The best answer, as I believe, to this question is found at the Health Office. In 1882 and thus far in 1883, there have been in round numbers 260,000 vaccinations preformed by the vaccine physicians alone. Is it not a low estimate to say that half that number have been vaccinated by all the physicians in private medical practice? This will give, in round numbers, about 400,000 vaccinations in fourteen months. If these figures can be received as an approach to certainty, and I think they can, it might be used as an argument against the efficiency of the bovine virus now in use. The statement would stand thus: An estimated 400,000 vaccinations, in a population estimated at 400,000 persons; and yet there were fifteen deaths from variola reported at the Health Office last week. It is admitted, however, that the force of the epidemic is broken, and it is further admitted that it has been broken by vaccination. The corollary from this statement is, that there was a large unprotected population in Baltimore prior to 1881. Who were they? And where did they come from? They did not come from under your hands or mine.

My own observations would classify those unprotected as follows: First, a large number of colored persons, who came into Baltimore from the rural districts of Maryland, and other Southern States, where vaccination, and especially revaccination, had been long neglected.

Second, an Irish population, who refused to be revaccinated because, as they said, they had been "inoculated" at home. In the rural districts of Ireland, the words inoculation and vaccination are used as synonyms. And hence these persons were unprotected by revaccination. Third, a class who, from early and deep prejudice against vaccination, refused to have the operation performed. To these must be added a fourth class of imperfectly vaccinated persons, that is, those in whom the vaccine disease, from a variety of causes, was imperfect, and hence unprotective. All these four classes of persons had accumulated in Baltimore since the last epidemic, which occurred in 1863. As pertinent to the class of imperfect vaccinations, let me mention two facts. Some of those who had varioloid, during this epidemic, had been recently vaccinated, and even a few of those who died from variola or varioloid, had been recently vaccinated. There were enough of such cases during this epidemic in Baltimore to leave in the minds of many persons a thorough want of confidence in the vaccine system generally; also pertinent to the imperfect vaccinations, let me say, I know of a wholesale house on Baltimore Street, where over one hundred young men are employed. These clubbed together and bought virus at ten cents a point, with which they vaccinated each other. What did they know of the vaccine disease? Whether it was perfect, genuine and protective, or not?

Is there any of us, if these facts are admitted, who will wonder at the large number of imperfect vaccinations?

There are many distinct practical questions concerning vaccination, upon which those who have thought of the subject have formed opinions. I will mention two, one of which was spoken of at the last meeting of this

society. It is this: Does the breaking of the vesicle or pustule diminish the protective power of the disease? I believe in the affirmative, but have no other proof or reasons to offer but this: the genuine vaccine disease is an entire process, in which the local point and the areola play their parts, and to go through the regular and uniform course of the vaccine disease, it is necessary for the preservation of the areola, that the vesicle and pustule should remain intact. If the local point be broken in either of its stages, it produces irregularities in the course of the disease.

The next question has a bearing upon the first—it is concerning the manner of performing the operation of vaccination. With the bovine virus sent from most of the establishments, printed slips accompany the matter, giving directions for the performance of the operation. Most of these direct, to scrape the skin, short of drawing blood, and then to rub in the virus. If the skin be scraped, over too large a surface, and too much, it weakens it; and the vesicle is more apt to break. I prefer the operation by incisions, which can be opened by stretching the skin and into these incisions the virus is inserted. I can imagine nothing better than the sharpened quills used by the National Vaccine Company of Washington. The sharpened quills tear the skin, without drawing too much blood; and as there is no lancet used, each operation is a separate thing in itself, without fear of infection even from the lancet; and at the same time the operation by the quill is less painful than a lancet. The only thing against the general use of the quill, in this way, is its great simplicity. It is often said, vaccination may be done in any way, as it is so small an operation. It is a small operation, but its results are immense; and since there may be a choice in the way of performing even the slightest operation, it is worthy of study how to perform vaccination to the best advantage. Above all, in public practice, do not be so slovenly as to vaccinate an entire school with one lancet, as it has been reported some operators have done.

In conclusion, let me say I have shown to you, as far as I could, the vaccination of the past, as well as the present, and now, who will venture to scatter the sibyl leaves of its future?

I have shown you what I believe to be true, that physicians and the public had a good thing in that virus, which protected the Chatard children, the infant on Marion Street and John Bayne. Whether this virus was well managed, or whether, if differently managed, it might have swept the earth clean of variola, and obliterated it, we shall never know.

It was the continued presence of variola, during its use, which caused a desire on the part of the profession and the public to change or improve it. In the light of history, the question may now be asked, was the work done in the right direction when the attempt was made only to "renew" it, either by variolation, retro-vaccination, or by finding the original vaccinia? Might the work not have been better done by seeking to improve, in detail, the ways of using it?

Experiments for renewing the vaccine virus, that is, retro-vaccination and variolation, were largely carried on everywhere, during the decades of 1830 and '40, but yet the presence of variola continued, and rather increased.

The epidemic of 1863 in Baltimore, and the considerable prevalence of variola during several other years to a less extent, caused increased restlessness in the minds of medical men and the public concerning the virus then in use, until the question fully culminated about the years 1872 and '73, in the introduction and reception of the Beaugency bovine virus. It was an easy conquest.

I have laid before you the situation of vaccination at present. We may all have our individual opinions about it. For one, I sometimes feel as if we had lost a good thing in striving after a better; but yet, it seems to me, a great step has been made in advance if the present stand point can be made good. Physicians, it is true, have no longer control of the virus. Tom, Dick and Harry are in full scramble for the gain of furnishing it to them and the public. We are now flooded with bovine virus from all points. The difficult questions for physicians to decide for themselves and the public are, which is really the best virus, and how shall it be preserved, and properly used? In the present state of the case the reports which have been made upon the management of the vaccine farms, and printed in the *Med. News*, must have a good effect.

From what has been said, it is plain that there is a protective vaccine disease, which can be recognized by one who will study it. Again, there are irregular forms of the vaccine disease, which are not protective, and these can also be recognized by authorities on the subject. I believe that the non-protection from the irregular forms of the disease can be overcome, that is, by continuing to vaccinate any individul from time to time. Either some one of the vaccinations will produce the genuine vaccine disease, or the aggregate of the vaccinations will be equivalent to it in protective power. It is fair to expect that the immense benefits of vaccination will be continued from the point where we are now, only by care and labor. Who are the proper persons to carry on this work and see that it is faithfully performed? It is the physicians.

On account of the continued and increasing prevalence of smallpox, anti-vaccination is advocated by able men, who pursue their subject with line and figures. There are, for the most part, amongst the anti-vaccinists, prominent statisticians, earnest students and thinkers, and astute theorists. There are few practical men with them who have come face to face with both diseases. It is possible anti-vaccination may prevail; and, indeed, it is not altogether improbable, provided the subject of vaccination is not pursued in the right way by its advocates.

Those who take the affirmative, upon the subject of vaccination, must therefore be upon the alert. They must not only believe in the absolute truth of the protective power of vaccination, but they must work for its perfection. They must believe that when variola is raging in its contagiousness, vaccination is almost as valuable as life itself. For, what with the dread of dying by smallpox, and the hurried burials after death from this disease, together with the fear of being disfigured by it, what is life worth? Those who take the affirmative must not only set forth the great importance of vaccination, but they must, at the same time, strive to keep it at a

high standard of excellence; for by inferior management it is easily deteriorated.

Within the last ten years the confidence in the protective power of vaccination has been weakened. The subject is now surrounded with the difficulties of skepticism. It is besieged, and it may be in danger. The agnostics are around it. It is again upon trial, as it was at first; and its vindication and triumph is in the hands of the medical profession to whom it rightfully belongs. The principle difficulties connected with the subject now, are to find the best genuine protective virus; to use it properly after it is found; and when occasion offers to demonstrate its power in the most public way.